# 2006
# Fire Weather Forecasting Services
for
North Dakota

**Introduction**
This Annual Operating plan is a procedural guide, based on the National Interagency Agreement for Meteorological Services, which describes fire meteorological services provided within North Dakota.

**Service Area and Organizational Directory**
The NOAA National Weather Service Office in Bismarck (WFO BIS) is responsible for the fire weather program in central and western North Dakota (Fire Weather zone 134). The NOAA National Weather Service Office in Grand Forks (WFO FGF) is responsible for eastern North Dakota (Fire Weather zone 135). See Figure 1. Points of contact can be found starting on page 4. The normal fire weather season begins in early April and continues to around the end of October. The season will vary according to the actual weather. Fire weather forecasts and other fire weather related information can be found on the Bismarck and Grand Forks Internet web pages: http://www.crh.noaa.gov/bis/ or http://www.crh.noaa.gov/fgf/

**Services Provided by the NOAA National Weather Service**
A. Basic Services
1. Rangeland Fire Danger Forecast - Routine

This product is issued by WFO BIS and covers **all** of North Dakota and is issued daily around 5:00 am CDT during the fire weather season. It is a forecast of the potential for non-agricultural grasslands to carry fire. It is based on the temperature, humidity, wind, sky cover and the estimated "greenness" of the fuel. The highest threat period for the rangeland fire danger is usually before the spring green-up and again in the fall. This product is intended for public use as well as for state and local authorities. The product will be updated if conditions vary significantly from those forecast. The Rangeland Fire Danger Statement contains the numerical values generated when determining the Rangeland Fire Danger Index for each Fire Zone, and may be useful to local fire management officials for daily planning and preparedness purposes.

| Rangeland Fire Danger Numerical Values | Rangeland Fire Danger Index Rating |
|---|---|
| 95 + | Extreme |
| 71 – 94 | Very High |
| 51 – 70 | High |
| 31 – 50 | Moderate |
| 0 - 30 | Low |

In case of extreme fire weather conditions, the NOAA NWS will, upon recommendation of the North Dakota Fire Council via the North Dakota Division of Emergency Management, place selected counties in the "Extreme" category regardless of the daily weather conditions.

See Figure 2 for an example of this product.

2. Daily Planning Forecast - Routine

This forecast product is issued twice daily during the fire weather season (730 am and 330 pm). The morning forecast contains a brief weather discussion, forecasts for today, tonight and tomorrow, and a general 3 to 7-day forecast. The afternoon forecast covers the periods of tonight, tomorrow, tomorrow night, the following day and a general 3 to7-day forecast. The product will be updated as needed. The "Discussion" should be tailored to address items of importance to the fire weather forecast. Persistent errors or biases in the forecast should be brought to the attention of the NOAA NWS. The local optional elements may vary from office to office.

The Bismarck morning discussion will contain inversion information based on the morning Bismarck sounding. The Bismarck optional local elements will be the mid-level Haines index (Figure 3a), LAL (Figure 3b), Chance of Wetting Rain (CWR >.10 inches), transport wind, mixing height and smoke dispersal (Figure 6). See Figure 4 for examples of these products.

3. Fire Weather Watch/Red Flag Warning (non-routine)

These products are essential to the safety of the fire crews. Because of this, a Red Flag Warning should be issued even if the event appears to be borderline. Coordination with surrounding offices and land management agencies is essential. Red flag warnings should be issued any time of the day if conditions warrant.

1) A Fire Weather Watch will be issued when the potential for Red Flag conditions are expected in the next 12 to 72 hours.

2) A Red Flag Warning will be issued if the Red Flag criteria, given below, are expected to be met within the next 24 hours, are imminent or are occurring.

The Red Flag information will be included as a "headline" in the daily planning forecast. It will also be disseminated as a special product (see Figure 8) that is available on the Internet and NOAA Weather Wire. In addition, the North Dakota Inter-agency Dispatch Center will be notified by phone at 701-768-2878 (after hours and on weekends call the duty officer at 701-263-7306).

A Red Flag event is defined as weather conditions which could sustain extensive wildfire activity and meet one or more of the following criteria in conjunction with Very High or Extreme fire danger:

a. Sustained surface winds, or frequent gusts, of 25 mph or higher.

b. Unusually hot and dry conditions (e.g. RH less than 20 %).

c. Dry thunderstorm activity is foreseen during an extremely dry period.

d. Anytime the forecaster foresees a change in weather that would result in a significant increase in fire danger (e.g. very strong winds associated with a cold front even though the rangeland fire danger index is below the very high category, extensive lightning, etc).

See the RH/Wind guidance matrix in Figure 9.

4. Spot Forecasts (non-routine)

a. Policy

-Spot Forecasts will be issued upon request of any federal, state, tribal, or local official in support of a **wildfire**.

-Upon request of any **federal official** as required under the Interagency Agreement

-Upon request of any state, tribal, or local official **in coordination with any federal land management agency.**

-Upon request of any public safety official when **essential to public safety**

-Will **not** provide to private citizens or commercial entities not acting as an agent of a government agency.

b. Procedure for Requesting Spot Forecasts

The preferred method to request a spot forecast is via the internet web pages (Figure 5a):

http://www.crh.noaa.gov/bis/ or http://www.crh.noaa.gov/fgf/

Requests for Spot forecasts to WFO Bismarck (Fire Zone 134) can also be made using WS Form D-1 or equivalent (Figure 5b). Normally, requests/forms should be submitted by fax (701-250-4450). Topographic information and observed weather conditions should be provided when appropriate/available. Phone inquiries should be directed to 701-250-4494. For Spot Forecast service in eastern North Dakota (Fire Zone 135), call WFO Grand Forks at 701-795-5127. The Spot Forecast will be posted to the web page and can be faxed to the requesting agency upon request. Our goal is to provide a forecast within 30 minutes of the request, however, higher priority duties may occasionally delay the spot forecast. An updated Spot Forecast may be requested if it appears conditions are significantly different than those forecast. Feedback on the utility of the Spot Forecast is requested.

The NWS will strive to provide as much detail as possible in the wind forecast. This includes specific wind shift times, wind gusts, etc.

c. Weather Elements Included in Spot Forecasts

Discussion - A brief synopsis of weather features affecting the area

Sky/Weather, Maximum/Minimum Temperature, Maximum/Minimum RH, 20 foot Winds, Wind Shifts/Gusts, Instability

Optional Elements (BIS) - Haines index, transport wind, mixing depth, LAL, and Chance of wetting rain (>.10 inches). These elements may vary from office to office.

See Figure 7 for an example of a Spot Forecast.

B. Special Services

**Incident Response Meteorologist**

If a wildfire is, or is expected to be, uncontrollable, and loss of life and/or considerable property damage is a possibility, the land management agency may request an on-site deployment of a trained and certified NWS Incident Meteorologist (IMET). The NWS IMET provides the Incident Command Team with 24-hour on-site fire weather support. The IMET's equipment requires at least 1 phone line, electrical power and a dry shelter at, or near, the command site. To request an IMET deployment, contact the ND Dispatch Center. Expenses are the responsibility of the requesting agency.

**Contact Points:**

**National Weather Service:**

Jim Meyer
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Gary Schmeling
Operational Services Meteorologist
National Weather Service Central Region
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Meteorologist in Charge
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Al Voelker
Fire Weather Program Leader
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**US Fish & Wildlife Service:**

Shane Del Grosso, Zone Fire Management Officer
Huron Wetland Management District

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Huron, SD 57350
shane_delgrosso@fws.gov

**North Dakota Dispatch Center**
Andrew L. Randall, Dispatch Center Manager
681 Salyer Road
Upham, ND 58789
ndndc@dms.nwcg.gov

Lily Huskey, Lead Dispatcher
ND Interagency Dispatch Center
ndndc@dms.nwcg.gov

**US Forest Service, Dakota Prairie Grasslands:**

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**National Park Service:**
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Medora, ND 58645



**North Dakota Forest Service:**
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Bismarck, ND 58501
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**North Dakota Division of Emergency Management:**
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Bismarck, ND 58506-5511
Amy Anton
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**Bureau of Indian Affairs**
Darrel Ausborn
Fire Management Officer
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Aberdeen, SD 57401
mailto:364935@pop.net

**Northern Rockies Predictive Services**
Fire Weather Program Manager
5765 West Broadway Street
Missoula, MT 59808

www.fs.fed.us/r1/fire/nrcc/

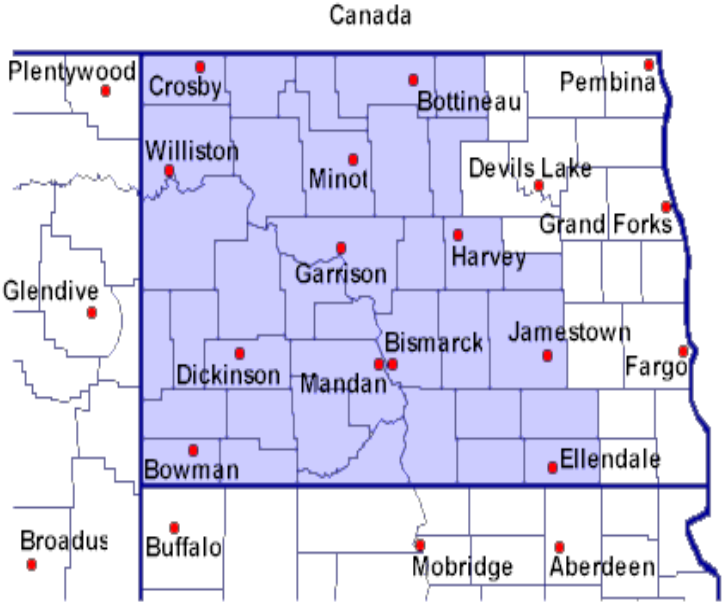



Figure 1. Fire Weather Zone 134 (shaded). Unshaded portions of North Dakota are Fire Weather Zone 135.

500 AM CDT THU APR 19 2001

...THE RANGELAND FIRE DANGER INDEX WILL REMAIN IN THE LOW CATEGORY STATEWIDE TODAY...

SYNOPSIS...LOW PRESSURE APPROACHING FROM THE WEST AND AN UPPER LEVEL DISTURBANCE WILL BRING SHOWERS TO THE STATE DURING THE NEXT 24 HOURS.

FAR NORTHWEST RURAL FIRE ZONE 1...FIRE INDEX=LOW
...DIVIDE...WILLIAMS...MCKENZIE

FAR SOUTHWEST RURAL FIRE ZONE 2...FIRE INDEX=LOW
...GOLDEN VALLEY...BILLINGS...SLOPE...BOWMAN

SOUTHWEST RURAL FIRE ZONE 3...FIRE INDEX=LOW
...DUNN...STARK...HETTINGER...ADAMS

NORTH CENTRAL RURAL FIRE ZONE 4...FIRE INDEX=LOW
...BURKE...MOUNTRAIL...RENVILLE...WARD...BOTTINEAU...MCHENRY
...ROLETTE...PIERCE

CENTRAL RURAL FIRE ZONE 5...FIRE INDEX=LOW
...MCLEAN...SHERIDAN...MERCER...OLIVER...MORTON...BURLEIGH

SOUTH CENTRAL RURAL FIRE ZONE 6...FIRE INDEX=LOW
...GRANT...EMMONS...SIOUX

NORTHEAST RURAL FIRE ZONE 7...FIRE INDEX=LOW
...TOWNER...CAVALIER...PEMBINA...BENSON...RAMSEY...WALSH...WELLS...EDDY
...FOSTER...NELSON...GRAND FORKS...GRIGGS...STEELE...TRAILL

EAST CENTRAL RURAL FIRE ZONE 8...FIRE INDEX=LOW
...KIDDER...STUTSMAN...BARNES...LOGAN...LAMOURE...MCINTOSH...DICKEY

FAR SOUTHEAST RURAL FIRE ZONE 9...FIRE INDEX=LOW
...CASS...RANSOM...SARGENT...RICHLAND

OUTLOOK FOR TOMORROW...LOW

CONTACT LOCAL FIRE OFFICIALS...THE STATE FIRE MARSHAL OR THE NORTH DAKOTA DIVISION OF EMERGENCY MANAGEMENT FOR INFORMATION ON RESTRICTIONS OR PROHIBITIONS.

27*27*27*21*21*21*22*22*22*

**Figure 2**

Computing the Haines Index in Middle Terrain Elevations

Stability Term= Temp(850mb) - Temp(700mb)
Moisture Term = Temp(850mb) -Dew Point Temp(850mb)

Each term is given a value of either 1, 2 or 3.
Stability Term Value:
1 – if 5 deg C or less
2 – if 6-10 deg C
3 – if 11 deg C or more

Moisture Term Value:
1 – if 5 deg C or less
2 – if 6-12 deg C
3 – if 13 deg C or more

The Stability and Moisture terms are added to calculate the Haines index.

| | |
|---|---|
| 2 or 3 | Potential for large fire growth...very low |
| 4 | ...low |
| 5 | ...moderate |
| 6 | ...high |

**Figure 3a**

**Lightning Activity Level Guide**

| | |
|---|---|
| **LAL** | **Coverage** |
| 1 | No T-storms |
| 2 | Isolated T-storms (1-14% coverage) |
| 3 | Widely Scattered T-Storms (15-24% coverage) |
| 4 | Scattered T-storms (25-54% coverage) |
| 5 | Numerous (55+% coverage) |
| 6 | >=15% coverage...little or no rain |

**Figure 3b**

FIRE WEATHER PLANNING FORECAST (MORNING)

NATIONAL WEATHER SERVICE

TIME-DATE

...HEADLINE... (REQUIRED FOR RED FLAG WARNINGS AND FIRE WEATHER WATCHES...SIGNIFICANT FEATURES AT OTHER TIMES RECOMMENDED)

.DISCUSSION...

NDZXXX-XXX>XXX-DDHHMM-
GEOGRAPHICAL DESCRIPTORS

...RED FLAG WARNING/FIRE WEATHER WATCH HEADLINE... (AS NEEDED)

.TODAY...
SKY/WEATHER.....
MAX TEMPERATURE.....
24 HR TREND.....
MIN HUMIDITY.....
24 HR TREND.....
WIND (20 FT)...../.....
OPTIONAL ELEMENTS...

.TONIGHT...
SKY/WEATHER.....
MIN TEMPERATURE...
24 HR TREND.....
MAX HUMIDITY.....
24 HR TREND.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

.TOMORROW...
SKY/WEATHER.....
MAX TEMPERATURE...
MIN HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS....

.FORECAST DAYS 3 THROUGH 7... (WINDS MUST BE INCLUDED DAYS 3-5)

.DAY3... (DAYS CAN BE COMBINED)

.DAY4...

.DAY5...

.DAY6...

.DAY7...

$$

[FORECAST FOR NEXT GEOGRAPHICAL DESCRIPTOR AND FIRE WEATHER ZONE GROUP]

$$

FIRE WEATHER PLANNING FORECAST (AFTERNOON)

NATIONAL WEATHER SERVICE

TIME-DATE

...HEADLINE... (REQUIRED FOR RED FLAG WARNINGS AND FIRE WEATHER WATCHES...SIGNIFICANT FEATURES AT OTHER TIMES RECOMMENDED)

.DISCUSSION...

NDZXXX-XXX>XXX-DDHHMM-

GEOGRAPHICAL DESCRIPTORS

...RED FLAG WARNING/FIRE WEATHER WATCH HEADLINE... (AS NEEDED)

.TONIGHT...

SKY/WEATHER.....

MIN TEMPERATURE...

24 HR TREND.....

MAX HUMIDITY.....

24 HR TREND.....

WIND (20 FT).....

OPTIONAL ELEMENTS...

.TOMORROW...

SKY/WEATHER.....

MAX TEMPERATURE...

24 HR TREND.....
MIN HUMIDITY.....
24 HR TREND.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

.TOMORROW NIGHT...
SKY/WEATHER.....
MIN TEMPERATURE...
MAX HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

.FOLLOWING DAY...
SKY/WEATHER.....
MAX TEMPERATURE...
MIN HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

.FORECAST DAYS 3 THROUGH 7... (WINDS MUST BE INCLUDED DAYS 3-5)
.DAY3... (DAYS CAN BE COMBINED)
.DAY4...
.DAY5...
.DAY6...
.DAY7...

$$
[FORECAST FOR NEXT GEOGRAPHICAL DESCRIPTOR AND FIRE WEATHER ZONE GROUP]

$$

**Figure 4**

# BISMARCK SPOT FORECAST REQUEST

Required Elements in RED

## PROJECT NAME

**Project Name:**

☐ Wildfire ☐ WFU ☐ HAZMAT

☐ Prescribed Fire ☐ SAR

Ignition Time: 1525 ☐ Central Local Time ☐ Mountain Local Time

Date: 1/31/05

## REQUESTING AGENCY

**NOTE: Do not use commas in this section.**

**Requesting Agency:** test

**Requesting Official:**

**Phone Number:** (701) 250-4224 Ext.

FAX Number: (701) 250-4450

Contact Person: jim fors

## REASON FOR SPOT FORECAST REQUEST

**Must choose either Wildfire or one of the Non-Wildfire reasons**

☐ **Wildfire**

**Non-Wildfire**

☐ Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA).

☐ State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services.

☐ Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.

**For NWS Spot forecast policy, see section 4.0 in NWS Instruction 10-401 at**
**http://www.nws.noaa.gov/directives/010/010.htm**

## LOCATION

**Lat:**

**Lon:**

7.5' Quad:

Top Bottom

**Elevation:**

Drainage:

**Aspect:**

Size: (Acres)

## FUEL

Type:

Sheltering

☐ Full

☐ Partial

☐ Unsheltered

## OBSERVATIONS

| Place | Elev | Time | Wind | Temp | Wetbulb | RH | Dewpt. | Sky/Weather |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

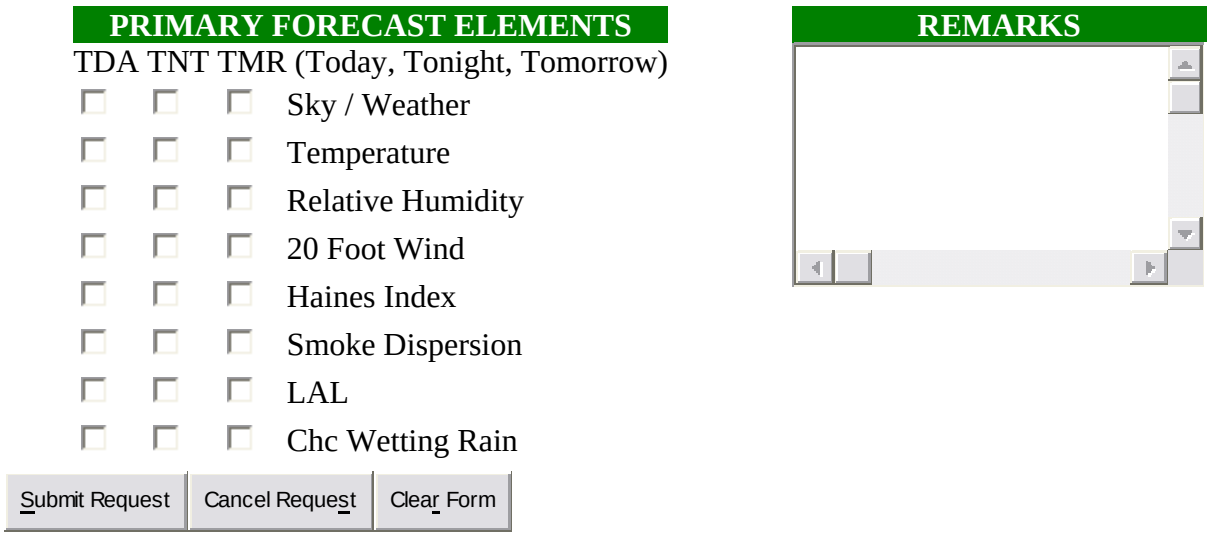



**Figure 5a**

| WS FORM D-1<br>(1-2005)<br>(Supersedes Previous Editions) | **SPOT REQUEST**<br>(See reverse for instructions) | U.S. Department of Commerce<br>NOAA<br>National Weather Service |
|---|---|---|

**Please call the NWS Weather Forecast Office (WFO) when submitting a request and also after you receive a forecast to ensure request and forecast were received.**
**Please provide feedback to WFO on forecast.**

| **1. Time†** | **2. Date** | **3. Name of Incident or Project** | **4. Requesting Agency** |
|---|---|---|---|
| | | | |

| 5. Requesting Official | 6. Phone Number | 7. Fax Number | 8. Contact Person |
|---|---|---|---|
| | | | |

| 9. Ignition/Incident Time and Date | 12. Reason for Spot Request (choose one only) | 13. Latitude/Longitude: |
|---|---|---|
| 10. Size (Acres) | o **Wildfire**<br>o **Non-Wildfire** Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA)<br>o **Non-Wildfire** State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services<br>o **Non-Wildfire** Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure. | 14. Elevation (ft, Mean Sea Level)<br>Top: Bottom: |
| 11. Type of Incident<br>o **Wildfire**<br>o **Prescribed Fire**<br>o **Wildland Fire Use (WFU)**<br>o **HAZMAT**<br>o **Search And Rescue (SAR)** | | 15. Drainage |
| | | 16. Aspect / 17. Sheltering<br>o **Full**<br>o **Partial**<br>o **Unsheltered** |

**18. Fuel Type:** __Grass __Brush __Timber __Slash __Grass/Timber Understory __Other_____
**Fuel Model:** 1,2,3 4,5,6,7 8,9,10 11,12,13 2,5,8

**19. Location and name of nearest weather observing station** (distance & direction from project):

**20. Weather Observations from project or nearby station(s)**: (Winds should be in compass direction e.g. N, NW, etc.)

| Place | Elevation | †Ob Time | 20 ft. Wind Dir | 20 ft. Wind Speed | Eye Level Wind. Dir | Eye Level Wind. Speed | Temp. Dry | Temp. Wet | Moisture RH | Moisture DP | Remarks *(Relevant Weather, etc)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| 21. Requested Forecast Period Date | 22. Primary Forecast Elements (Check all that are needed) *(for management ignited wildland fires, provide prescription parameters):* | 23. Remarks (other needed forecast elements, forecast needed for specific time, etc.) |
|---|---|---|
| **Start** _____<br>**End** _____<br>**Forecast needed for:**<br>o **Today**<br>o **Tonight**<br>o **Day 2**<br>o **Extended** | **Needed:**<br>**Sky/Weather** __<br>**Temperature** __<br>**Humidity** __<br>**20 ft Wind** __<br>**Valley** __<br>**Ridge Top** __<br>**Other (Specify in #23)** __ | |

| 24. Send Forecast to:<br>ATTN: | 25. Location: | 26. Phone Number:<br>Fax Number: |
|---|---|---|

**27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):**

**EXPLANATION OF SYMBOLS:** † Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015
Indicate local standard time or local daylight time

**WS FORM D-1**

## WS FORM D-1, January 2005 INSTRUCTIONS:

### I. Incident Personnel:

1. Complete items 1 through 27 where applicable.
   a. Example of weather conditions on site:

| 13. Weather Observations from project or nearby station(s): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Place | Elevation | †Ob Time | 20 ft. Wind | | Eye Level Wind. | | Temp. | | Moisture | | Remarks *(Relevant Weather, etc.)* |
| | | | Dir | Speed | Dir | Speed | Dry | Wet | RH | DP | |
| Unit G-50 | 1530' | 0830 | NW | 6-8 | NW | 3-5 | 32 | | 72 | | Observations from unit RAWS station, 50% cloud cover. |

b. If the incident (HAZMAT, SAR) involves marine, put the wave/swell height and direction in the Remarks section.

2. Transmit in numerical sequence or fax to the appropriate Weather Forecast Office. (A weather forecaster on duty will complete the special forecast as quickly as possible and transmit the forecast and outlook to you by the method requested)
3. Retain completed copy for your records.
4. **Provide feedback to NWS utilizing separate page.** Be sure to include a copy of the spot forecast with any feedback submission including forecaster's name. Feedback to NWS personnel is imperative to assist with future forecasts. Remember, feedback on correct forecasts is equally as valuable as feedback on incorrect forecasts! If spot forecast is significantly different than conditions on site, a second forecast may be required.

**II. ALL RELAY POINTS should use this form to insure completeness of date and forecast. A supply of this form should be kept by each dispatcher and all others who may be relaying requests for forecasts or relaying completed forecasts to field units.**

**III. Forms are available from your local National Weather Service Weather Forecast Office. They may also be reproduced by other agencies as needed, entering the phone number and radio identification if desired.**

***NOTICE: Information provided on this form may be used by the National Weather Service for official purposes in any way, including public release and publication in NWS products. False statements on this form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.***

**Figure 5b**

## Smoke Dispersal Terms

| Category | Description |
|---|---|

**Very Poor** High smoke pollution potential. Usually occurs in a very stable air (strong inversion) and light winds. Normally occurs late at night and early in the morning hours, but could occur during the daytime when a shallow pool of cold air intrudes into the area creating strong low level inversions. Burning is not advised under this category.

**Poor** Moderate to High smoke potential. Burning not advised under this category. Most likely time of occurrence is from evening through the early morning.

**Fair** Marginal smoke pollution potential. Dependent on trend of weather and local conditions. Generally acceptable for small burns of dry fuels.

**Good** Moderate to Low smoke pollution potential. No inversion and gentle winds expected. Most likely to occur in the late morning and afternoon when surface heating usually breaks through the low level inversions.

**Very Good** Low smoke pollution potential. Transport winds or mixing height lower than that for Excellent. Transport winds stronger than that for Good. Most likely to occur in the late morning and afternoon.

**Excellent** Low smoke pollution potential. Unstable airmass and/or brisk winds. Best time to conduct burning operations if fire can be controlled. Most likely to occur in the late morning and afternoon or when a strong weather system affects the area, eliminating all low level inversions and generating moderate winds.

## Breakdown of Ventilation
## Based on Mixing Height and Transport Wind

Excellent.....150,000 Knot Feet and Greater
Very Good.....100,000 to 150,000 Knot Feet
Good.....60,000 to 100,000 Knot Feet
Fair.....40,000 to 60,000 Knot Feet
Poor.....Less than 40,000 Knot Feet

**Figure 6**

SPOT FORECAST FOR
NATIONAL WEATHER SERVICE
TIME-DATE

IF CONDITIONS BECOME UNREPRESENTATIVE, CONTACT THE NATIONAL WEATHER SERVICE.

...HEADLINE... (REQUIRED IF FIRE WEATHER WATCH/RED FLAG WARNING IN EFFECT)

DISCUSSION...

FIRST PERIOD
SKY/WEATHER.....
TEMPERATURE.....
HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

SECOND PERIOD
SKY/WEATHER.....
TEMPERATURE.....
HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

THIRD PERIOD
SKY/WEATHER.....
TEMPERATURE.....
HUMIDITY.....
WIND (20 FT).....
OPTIONAL ELEMENTS...

FORECASTER...
$$
REQUESTING OFFICIAL...
REASON FOR REQUEST...

**Figure 7**

RED FLAG WARNING/(FIRE WEATHER WATCH)

NATIONAL WEATHER SERVICE BISMARCK ND

430 AM CDT SAT OCT 21 2005

NDZ001>005-009>013-017>023-025-031>037-040>048-050-051-212300-

ADAMS-BURKE-...etc

430 AM CDT SAT OCT 21 2005

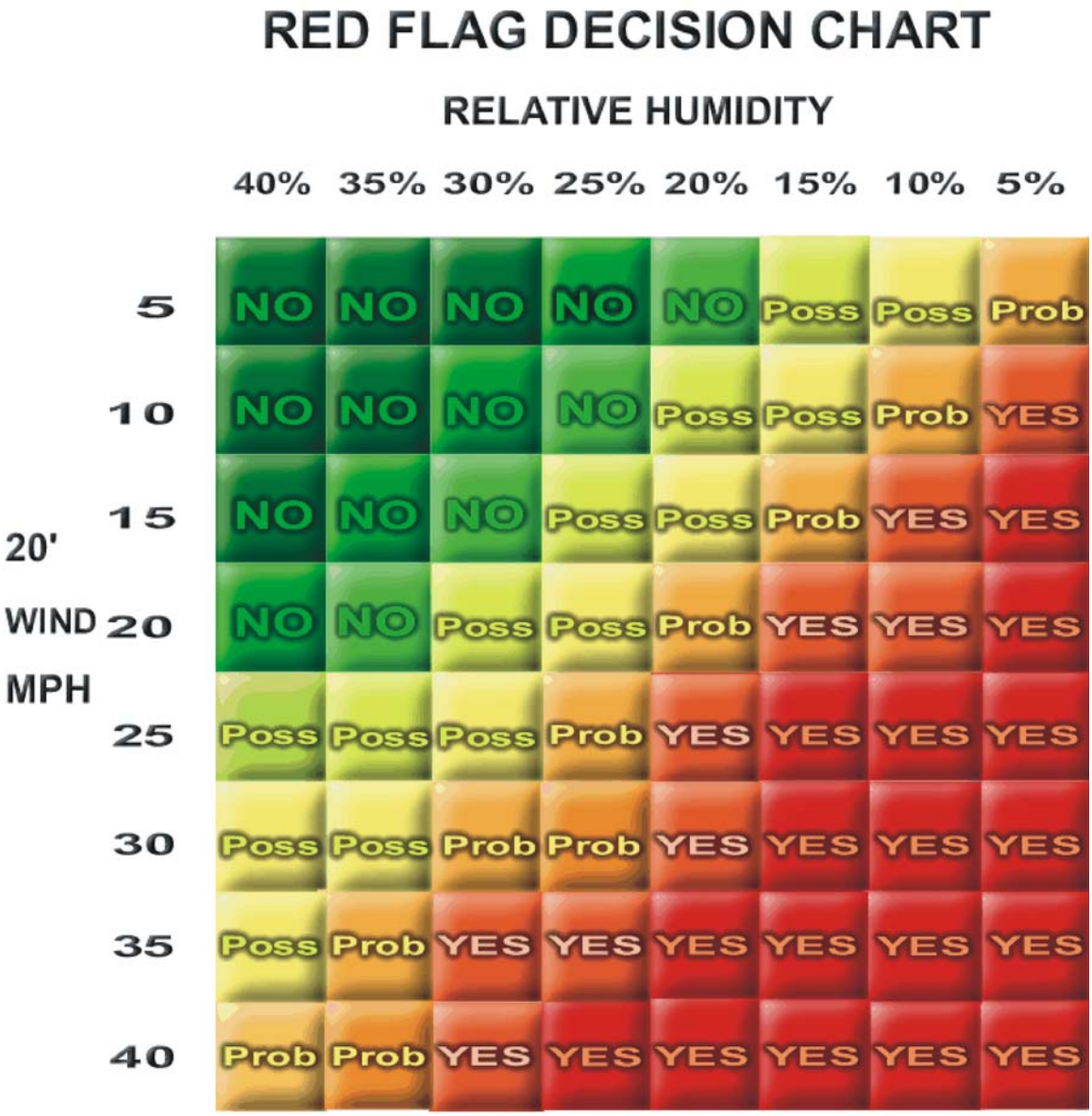
...RED FLAG WARNING FOR STRONG SOUTH WINDS AND LOW HUMIDITIES FOR WESTERN AND CENTRAL NORTH DAKOTA THIS AFTERNOON...

**THE NATIONAL WEATHER SERVICE IN BISMARCK HAS ISSUED** A RED FLAG WARNING FOR STRONG SOUTH WINDS AND LOW HUMIDITIES THIS AFTERNOON FOR WESTERN AND CENTRAL NORTH DAKOTA. THE GUSTY WINDS ARE BEING PRODUCED BY A STRONG HIGH PRESSURE SYSTEM OVER THE GREAT LAKES AND A COLD FRONT MOVING TOWARD THE NORTH DAKOTA BORDER FROM CENTRAL MONTANA. THE WINDS WILL SHIFT TO THE NORTHWEST AND DECREASE TO 10 TO 20 MPH BEHIND THE FRONT AS IT PASSES THROUGH WESTERN AND CENTRAL NORTH DAKOTA THIS EVENING.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS RED FLAG WARNING.

$$

**Figure 8**




RED FLAG DECISION MATRIX

Bismarck's Fire Weather Forecasters use the following Red Flag Decision Matrix, based on increasing wind and low relative humidity, as a "first look" to consider the need for a Red Flag Warning. This chart is meant as a guide, and is not absolute.

| | |
|---|---|
| **NO** | No Red Flag Warning needed. |
| **POSS** | Possible Red Flag Warning; Not likely, but may be needed depending upon criteria in addition to wind speed and RH. |
| **PROB** | Probable Red Flag Warning; Likely warranted, depending upon other red flag criteria in addition to wind speed and RH. |
| **YES** | Red Flag Warning needed based solely on wind speed and RH. |

Figure 9.

This plan is valid for the 2006 fire season.

Jim Meyer, NOAA National Weather Service
4/01/06

??, North Dakota Fire Council